REMARKS

The above amendments to the specification, claims and abstract have been made to place the application in proper U.S. format and to conform with proper grammatical and idiomatic English. None of the amendments herein are made for reasons related to patentability. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 449122007200. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: August 21, 2001

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

For the convenience of the Examiner, the changes made are shown below with deleted text in strikethrough and added text in underline.

In the Specification:

Page 1 before the first paragraph, please delete the following:

~~Description~~

Please replace the title as follows:

SYSTEM AND METHOD FOR TRANSMITTING SIGNALS IN A RANDOM ACCESS CHANNEL OF A RADIO COMMUNICATION SYSTEM

Page 1 before the first paragraph, has been amended to include the following insert:

CLAIM FOR PRIORITY

This application claims priority to International Application No. PCT/DE99/03938 which was published in the German language on December 9, 1999.

Page 1, between lines 5 and 6 has been amended to include the following heading:

TECHNICAL FIELD OF THE INVENTION

Paragraph beginning on line 6 of page 1 has been amended as follows:

The invention relates to a method and ~~to a subscriber station~~ system for transmitting signals in a communication system, and in particular, to a method and subscriber station for transmitting signals in a random access channel of a radio communication system.

Page 1, between lines 5 and 6 has been amended to include the following heading:

BACKGROUND OF THE INVENTION

Page 1, between lines 8 and 9 has been amended to include the following paragraphs:

WO 95/24102 discloses a method for prioritizing calls in a mobile radio system in which a higher transmitting power is used for calls with high prioritization than for calls with lower priority. In the case of the calls with high priority, the transmission power is in each case increased by a constant amount. In EP 0 565 507 A, access bursts are transmitted in a mobile radio system in order to minimize interference at relatively low power. If the message is not detected, it is retransmitted with an in each case increasing power level until it is finally detected.

A method is described in K. David et al.: Digitale Mobilfunksysteme [Digital Mobile Radio Systems], Teubner Verlag Stuttgart 1996.

Paragraph beginning on line 9 of page 1 has been amended as follows:

In radio communication systems, messages (for example voice, picture information or other data) are transmitted via a radio interface with the aid of electromagnetic waves. The radio interface relates to a connection between a base station and subscriber stations, where the subscriber stations can be mobile stations or stationary radio stations. The electromagnetic waves are radiated by ~~means of~~ carrier frequencies which are within the frequency band provided for the respective system. For future radio communication systems, for example the UMTS (Universal Mobile Telecommunication System) or other third-generation systems, frequencies are provided in the frequency band of approx. 2000 MHz.

Paragraph beginning on line 9 of page 1 has been amended as follows:

A random access channel (RACH) of a radio communication system is characterized by ~~the fact that~~ the access to this channel ~~is~~ not being coordinated. The mobile stations of a radio cell can use this channel without prior allocation in order to request, for example, a subsequent allocation of radio resources, e.g. when setting up a connection.

Paragraph beginning on line 6 of page 2 has been amended as follows:

~~In~~ DE 198 17 771~~, it has been proposed, therefore, to admit~~ discloses admitting access blocks which are orthogonal to one another in time and ~~to reduce~~ reducing the probability of a collision by selecting one of a number of different access blocks, i.e. of different transmitting times within the channel.

Paragraph beginning on line 11 of page 2 has been amended as follows:

~~From~~ ETSI SMG2 UMTS L1 Expert Group, Tdoc SMG2 UMTS-L1 455/98, October 14, 1998, discloses another possibility for improving the efficiency of the described method ~~has become known~~. In this document, it is proposed to provide an incremental increase in power. The mobile station begins with a transmitting power which is reduced with respect to the normal power setting and incrementally increases the transmitting power until reception is acknowledged by the base station.

Page 2, between lines 20 and 21 has been amended to include the following paragraphs:

SUMMARY OF THE INVENTION

In one embodiment of the invention, there is a method for transmitting signals in a random access channel in a radio communication system having first and second subscriber stations. The method includes, for example, using the random access channel in an uncoordinated manner, determining an attenuation value for a respective transmission path for each subscriber station; and carrying out a signal transmission in the channel at a transmitting power which corresponds to the previously determined attenuation value, wherein the second subscriber station carry out a signal transmission in the channel at a transmitting power which is greater than a transmitting power corresponding to the previously determined attenuation value, so that the transmitting power is increased compared with the greater transmitting power.

In one aspect of the invention, there is the signal transmissions of the subscriber stations relate to certain applications, and a higher priority is allocated to the applications relating to the signal transmissions of the second subscriber stations before the signal transmission, than to the applications relating to the signal transmissions of the first subscriber stations.

In another aspect of the invention, the subscriber stations transmit signals which relate to a request for allocation of radio resources, an acknowledgement or messages for updating the location of subscriber stations.

In still another aspect of the invention, the signal transmission, a higher priority is allocated to the second subscriber stations compared with the first subscriber station.

In yet another aspect of the invention, the signal transmissions of the subscriber stations relate to certain services, and a higher priority is allocated to the services relating to the signal transmissions of the second subscriber station, before the signal transmission, than to the services relating to the signal transmissions of the first subscriber station.

In another aspect of the invention, the increase in transmitting power is changed with retransmission of the signal by the second subscriber station.

In still another aspect of the invention, the attenuation values for the transmission path are determined by evaluating the received power of a control channel.

In another aspect of the invention, the channel is a broadband channel and is arranged in accordance with a TDD or FDD mode of a UMTS mobile radio system.

In another embodiment of the invention, there is a subscriber station for a radio communication system which has a random access channel which is used in an uncoordinated manner by subscriber stations. The system includes, for example, a transmitting device to transmit signals in the random access channel, a unit to determine an attenuation value for a respective transmission path; and a control device to set transmit power for the signal transmission to a value which is greater than a transmitting power corresponding to the previously determined attenuation value.

BRIEF DESCRIPTION OF THE DRAWINGS

Exemplary embodiments of the invention will be explained in greater detail with reference to the attached drawings, in which:

Figure 1 shows a radio communication system.

Figure 2 shows an exemplary TDD radio interface between base station and subscriber stations.

Figure 3 shows an example of the transmitting power adjustment.

Figure 4 shows a simulation result.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Paragraph beginning on line 21 of page 2 has been amended as follows:

The invention discloses ~~is based on the object of further~~ increasing the efficiency of the signal transmission in the random access channel. ~~This object is achieved by the method having the features of claim 1 and the subscriber station having the features of claim 9. Advantageous further embodiments of the invention can be found in the subclaims.~~

Paragraph beginning on line 28 of page 2 has been amended as follows:

According to one embodiment of the invention, a number of subscriber stations use the random access channel in an uncoordinated manner and ~~in this channel~~ transmit signals with a transmitting power corresponding to predetermined attenuation values. ~~in which~~ In this rearrangement, however, the transmitting power is excessively increased for a subset of the first transmissions of the signal transmission. If there are collisions between two transmissions which now do not have the same received power at the base station, at least the more powerful signal can be utilized and ~~only~~ the transmission of the weaker signal needs to be repeated when there is sufficient difference in power. On average, this reduces the delay before the transmissions are successfully received.

Paragraph beginning on line 15 of page 3 has been amended as follows:

According to another embodiment ~~an advantageous further development~~ of the invention, the transmitting power is increased for a subset of applications. These applications are ~~thus~~ prioritized with respect to the probability of immediate detection. Such prioritization can also apply to a subset of the subscriber stations or a subset of services apart from the application, e.g. as request for the allocation of radio resources, as acknowledgement or as message for updating the location of subscriber stations. This makes it possible for the operater of the radio communication system to differentiate within applications, subscriber stations or services and to charge correspondingly for higher quality.

Paragraph beginning on line 36 of page 3 has been amended as follows:

According to still another ~~a further advantageous~~ embodiment of the invention ~~method~~, the transmitting power is excessively increased ~~in different steps~~. ~~Having a number of possible steps, the~~ The probability of transmissions arriving simultaneously with the same received power at the base station is further reduced. The transmission with the transmitting power with the greater excessive increase is successful. In the case of retransmissions, ~~the step of~~ excessive increase is changed. This can be done in the direction of reduced or increased transmitting power. This prevents the transmissions of two subscriber stations from taking place in parallel continuously with excessively increased but equal transmitting power. The choice in method ~~of step or change in step~~ is made by the subscriber station in an arbitrary manner, that is to say in a manner which is not necessarily the same for all subscriber stations.

Paragraph beginning on line 16 of page 4 has been amended as follows:

~~A particularly important factor is~~ In one aspect of the invention, the utilization of a resource unit of the radio resources in radio communication systems has ~~having~~ broadband

channels, since the smallest resource unit is relatively large. The channels are organized in accordance with a TDD or FDD mode of a UMTS mobile radio system.

Paragraph beginning on line 23 of page 4 has been amended as follows:

~~Exemplary embodiments of the invention will be explained in greater detail with reference to the attached drawings, in which:~~

~~figure 1 shows a radio communication system,~~

~~figure 2 shows a diagrammatic representation of a TDD radio interface between base station and subscriber stations,~~

~~figure 3 shows a simplified representation of the transmitting power adjustment and~~

~~figure 4 shows a simulation result.~~

Paragraph beginning on line 33 of page 4 has been amended as follows:

The mobile radio system shown in figure 1, as an example of a radio communication system, ~~consists of~~ includes a multiplicity of mobile switching centers MSC which are networked together and, respectively, represent the access to a landline network PSTN. Furthermore, these mobile switching centers MSC are connected to, in each case, at least one device RNC for controlling the base stations BS and for allocating radio resources, i.e. a radio resource manager. Each of these devices RNC, in turn, provides for a connection to at least one base station BS. Such a base station BS can set up a connection to a subscriber station, e.g. mobile stations MS or other types of mobile and stationary terminals, via a radio interface. Each base station BS forms at least one radio cell.

Paragraph beginning on line 9 of page 6 has been amended as follows:

Figure 1 shows by way of example connections V1, V2, V3 for transmitting user information ni and signaling information as point-to-point connections between mobile stations

MS and a base station BS and a control channel BCCH as point-to-multipoint connection. In the control channel BCCH, control information oi is transmitted by the base station BS at a known constant transmitting power. ~~and this~~ This information can be utilized by ~~all~~ subscriber stations MS and can include ~~contains~~ information on the services offered in the radio cell and on the configuration of the channels of the radio interface. In the uplink UL, a random access channel RACH is offered to the subscriber stations MS.

Paragraph beginning on line 32 of page 7 has been amended as follows:

Although the mobile stations MS use the random access channel RACH in an uncoordinated manner, they do so with regulated transmitting power. For this purpose, attenuation values (path loss) are initially determined by measurements. The attenuation values can be advantageously determined by evaluation of the received power of the control channel BCCH, see figure 3. The control channel BCCH is continuously accessible and transmits at a known transmitting power. From the measured received power at the mobile station MS, a control device in the mobile station MS can calculate the transmitting power of a transmitting device of the mobile station MS which is necessary for a particular received power at the base station BS and which guarantees compensation for the loss. The lower the received power at the mobile station MS, the greater the transmitting power which must be set in the uplink UL.

Paragraph beginning on line 13 of page 8 has been amended as follows:

However, not all the mobile stations MS are necessarily transmitting, and not all are necessarily transmitting continuously at this calculated transmitting power., ~~and not continuously, but a~~ However, a subset of the applications, mobile stations MS or services (e.g. by ~~means of~~ the quality of service QoS) are prioritized so that an excessive transmitting power can also be used ~~already~~ in the first transmission. In figure 3, mobile station MS2 is prioritized. This excessive increase also leads to an increased received power in the RACH channel at the

base station BS. It is also within the scope of the invention that, in general, the level of the transmitting power of the initial transmission is lowered down to the subset.

Paragraph beginning on line 13 of page 8 has been amended as follows:

In comparison with a transmitting power referred to the attenuation, the transmitting power selected by a mobile station MS can be excessively increased to be lower, equal to or in accordance with a particular portion of the method~~step~~. A corresponding picture is produced with respect to the received power at the base station BS in the case of simultaneous transmission by the two mobile stations MS1 and MS2. In figure 3, the proportion of power of the signal is much greater from mobile station MS2 than from mobile station MS1. This results in a high probability that the received power will be sufficiently greater for a transmission to provide for utilization~~,~~ ~~nevertheless, even~~ Even in the case of collisions, i.e. the same type of use of the RACH channel by a number of mobile stations MS. In this case, ~~only~~ the remaining transmissions need to be repeated. If necessary, the repetition is carried out with ~~another step of the~~ an excessive increase in transmitting power and at a time interval which can be individually defined by each mobile station MS.

On page 9, line 1, please replace "Patent Claims" with --WHAT IS CLAIMED IS--.

In the Claims:

1. (Amended) A method for transmitting signals in a random access channel ~~(RACH)~~ in a radio communication system ~~which exhibits~~ having first and second subscriber stations, comprising: ~~(MS), in which~~

~~the subscriber stations (MS) use~~ using the random access channel ~~(RACH)~~ in an uncoordinated manner~~;~~,

determining an attenuation value for ~~the~~ a respective transmission path ~~is determined~~ for each subscriber station; and ~~(MS),~~

~~and the first subscriber stations (MS) carry~~ carrying out a signal transmission in the channel ~~(RACH)~~ at a transmitting power which corresponds to the previously determined attenuation value,

~~characterized in that~~ wherein the second subscriber station~~s (MS)~~ carry out a signal transmission in the channel ~~(RACH)~~ at a transmitting power which is greater than a transmitting power corresponding to the previously determined attenuation value, so that the transmitting power is ~~it is excessively~~ increased compared with the greater transmitting power ~~former~~.

2. (Amended) The method as claimed in claim 1, wherein ~~in which~~

the signal transmissions of the subscriber stations ~~(MS)~~ relate to certain applications, and

~~in which~~ a higher priority is allocated to the applications relating to the signal transmissions of the second subscriber stations ~~(MS)~~ before the signal transmission, than to the applications relating to the signal transmissions of the first subscriber stations.

3. (Amended) The method as claimed in claim 2, ~~in which~~ wherein the subscriber stations ~~(MS)~~ transmit signals which relate to a request for allocation of radio resources, an acknowledgement or messages for updating the location of subscriber stations ~~(MS)~~.

4. (Amended) The method as claimed in claim 1, wherein ~~one of the preceding claims, in which,~~ before the signal transmission, a higher priority is allocated to the second subscriber stations ~~(MS)~~ compared with the first subscriber stations.

5. (Amended) The method as claimed in claim 1, wherein ~~one of the preceding claims, in which~~

the signal transmissions of the subscriber stations ~~(MS)~~ relate to certain services, and

~~in which~~ a higher priority is allocated to the services relating to the signal transmissions of the second subscriber station~~s (MS)~~, before the signal transmission, than to the services relating to the signal transmissions of the first subscriber stations.

Please cancel claim 6.

7. (Amended) The method as claimed in claim 1, wherein ~~claim 6, in which the extent of~~ the ~~excessive~~ increase in transmitting power is changed with retransmission of the signal by the second subscriber station~~s (MS)~~.

8. (Amended) The method as claimed in claim 1, wherein ~~one of the preceding claims, in which~~ the attenuation values for the transmission path are determined by evaluating the received power of a control channel ~~(BCCH)~~.

9. (Amended) The method as claimed in claim 1, wherein ~~one of the preceding claims, in which~~ the channel ~~(RACH)~~ is a broadband channel and is arranged in accordance with a TDD or FDD mode of a UMTS mobile radio system.

10. (Amended) A subscriber station for a radio communication system which has a random access channel ~~(RACH)~~ which is used in an uncoordinated manner by ~~a number of~~ subscriber stations ~~(MS)~~, comprising:

~~comprising~~ a transmitting device to ~~for~~ transmit~~ting~~ signals in the random access channel ~~(RACH),~~;

~~comprising~~ a unit to ~~for~~ determine~~ing~~ an attenuation value for ~~the~~ a respective transmission path~~,~~; and

~~characterized by~~

~~and comprising~~ a control device to ~~for~~ set~~ting the~~ transmit~~ting~~ power for the signal transmission to a value which is greater than a transmitting power corresponding to the previously determined attenuation value.

In the Abstract:

Please replace the Abstract in its entirety with the Abstract attached hereto.

SYSTEM AND METHOD FOR TRANSMITTING SIGNALS IN A CHANNEL FOR ARBITRARY ACCESS TO A RADIOCOMMUNICATION SYSTEM (AS AMENDED)

Abstract

A system and method for transmitting signals in a communication system in a random access channel of a radio communication system.